

Director - Infrastructure Projects  
 Department of Planning and Environment  
 Number: SSI 13\_6136  
 Major Projects Assessment  
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Via online form: [http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6136](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6136)

NorthConnex Application Number: SSI 13\_6136

Please find below our submission in response to the exhibition of the EIS for NorthConnex.

We strongly object to the NorthConnex proposal (the Project) in its current form.

The reasons for our objection include failure of the Project to consider or address a number of critical issues which will result in the Project giving rise to significant adverse impacts on nearby residents health.

We request that each of the following issues be addressed prior to the NSW Department of Planning finalising its assessment and approval of the Project.

We are concerned about:

1. the multiple large scale research studies that suggest the impacts of air pollutants on health are serious. These include increased death from heart disease, increased risks of lung cancer, stroke, poor lung growth in children, increased asthma, and recent research suggesting low birth weight for pregnant women, increased autism, and congenital heart defects. These studies confirm air pollutants have prothrombotic and inflammatory effects on humans which cause the above health problems.
2. the Project including future provisions for portal emissions in densely populated areas, which will result in emissions remaining at ground level, and hence exposing the local population to pollutants. we are also concerned that NorthConnex's claim that there will no portal emissions from the current proposal cannot be verified.
3. the large amount of diesel emissions which will be emitted from the NorthConnex tunnel, as it is being designed for heavy freight to bypass Pennant Hills Rd. Diesel emissions have been classified as carcinogenic by the World Health Organisation, and also contain a larger number of fine particles which penetrate deep into lung tissue and remain there causing inflammation.
4. the air quality within the tunnel which is shown in the EIS to have exceedences above standards for pollutants such as NO<sub>2</sub>, and haze from particulate matter at the ends of the tunnel.
5. the multiple flaws in the air quality modelling of air emissions in the EIS. These include:
  - a) extrapolation of meteorological data from other weather stations which do not reflect the local meteorology, local topography, and the valley location.
  - b) The use of a coarse topographical model.
  - c) The failure to consider polluted intake air from the Pennant Hills/M2 interchange as part of the project contribution to air quality at Wahroonga and West Pennant Hills.
 the background air quality being based on air quality at Lindfield and Prospect and the lack of any actual data on PM<sub>2.5</sub>.
6. the lack of a full and transparent options assessment process was not undertaken to assess alternative designs for the project. Unlike other tunnel projects in Sydney there are alternatives for locating the stack and portals in non-residential areas.
7. the cursory and unconvincing justification for not providing filtration of the stacks.

To address our concerns we request that the following actions are undertaken:

1. The air quality and human health impact assessment need to be revised to address the issues raised above.
2. An independent options assessment process should be undertaken to assess alternative locations for the ventilation stack and portals.
3. To undertake a Life Cycle Analysis and assessment for the provision of filtration
4. A long term health study on children and residents in areas impacted by stack discharges be included as part of the conditions of approval.
5. A comprehensive air quality monitoring program is developed and implemented.
6. An independent review of the ventilation system is undertaken to ensure that NorthConnex's claim of no portal emissions is justified.
7. Portal emissions from NorthConnex in the future are banned.
8. The Submissions Report/Preferred Project be exhibited to allow the community to respond to the revised information contained in the report.
9. The Department does not approve the project in its current form as it clearly does not meet the principles of Ecologically Sustainable Development as required by the Environmental Planning and Assessment Act.

We also note:

**1. NorthConnex DOES NOT meet international best practice for tunnel emission controls.**

Health effects associated with particulate matter can occur after short term exposures (hours to days) and long term exposures (months to years). In addition, there is no evidence of a safe level of exposure to particulate matter or diesel emissions.

The NSW Government requires that emissions of air pollutants such as particulate matter, where any exposure has the potential to be associated with an adverse health effect, should be minimised to the maximum extent feasible by use of best practice process design and emission controls.

NorthConnex has not incorporated best practice process design or emission controls.

Community and government expectations are that NorthConnex will meet International Best Practice for emission prevention and capture. However the EIS DOES NOT contain any benchmarking assessment to demonstrate it meets international best practice.

*NorthConnex must implement best practice process design and emission controls.*

**2. The EIS does not demonstrate that the filtration of tunnel emissions is not a viable option for NorthConnex.**

The EIS indicates that the ventilation stacks will have no filtration. Current best practice in public health and urban infrastructure management by global standards requires that ventilation stacks be located away from residential areas. Where this is not possible, filtration should be used. This project however only proposes stacks in residential areas and precludes filtration.

The EIS:

- provides very limited evidence to suggest filtration for NorthConnex is not appropriate;
- lacks a proper and detailed analysis that demonstrates tunnel filtration is not feasible for NorthConnex; and
- does not provide information to demonstrate the current NorthConnex design meets best practice for particulate matter and other emission controls.

The EIS refers to the M5 East tunnel filtration trial to argue against filtration in NorthConnex. However the M5 East filtration system suffered many issues that were associated with non-optimal design and operation. Therefore it is not valid to recommend not installing mitigation equipment for NorthConnex based on the issues associated with the M5 East Tunnel.

In addition, the air assessment states that some of the drawbacks of filtration technologies include that they are pollutant specific and only address local and not regional transport related air pollution. In the context where regional transport related air pollution cannot be easily or quickly resolved, as exists today, any technology that reduces local air pollution is beneficial. In addition, the pollutant specific nature of filtration technologies does not necessarily mean that they are not effective technologies.

The community expects that NorthConnex will:

- be designed to implement all available measures to prevent or minimise pollution entering the surrounding community; and
- result in improved air quality, and not increase pollutant load, to the detriment of current or future air quality.

*NorthConnex must implement international best practice for emission capture and filtration. The Project must be benchmarked against worlds best practice used in other tunnels.*

**3. Worst case traffic model and emission scenarios, including short and long term local traffic effects caused by NorthConnex have not been assessed. Consequently potential worst case impacts have not been estimated.**

New road projects redistribute traffic **and add** extra traffic to an area. The assessment of air and health impacts does not appear to consider traffic redistribution and the extra traffic that will result.

The assessment of NorthConnex air or health impacts does not, but should include effects due to:

- potential tunnel avoidance;
- changes to surface roads and surface road usage;
- tunnel access ramps and interchanges; and
- greater congestion on surface roads near tunnel entrances/exits as a result of NorthConnex.

The assessment of NorthConnex air or health impacts does not, but should include effects due to increased traffic levels and congestion on surface roads (Pennant Hills Road) to pre-NorthConnex levels, including congested and incident conditions.

*The health assessments must be revised to provide and ensure assessment of potential worst case NorthConnex related air impacts. Both direct and indirect impacts caused by NorthConnex must be assessed, including congestion and incident scenarios.*

**4. Adverse health impacts have not been assessed for many likely and foreseeable scenarios.**

Scenarios such as a fire in one or both tunnels, or accidents and/or breakdowns in both tunnels, are likely to result in worst case air impacts inside the tunnels and highest emissions from the tunnels. In addition they will also result in significant redistribution of traffic and traffic congestion which will exacerbate emissions.

Incidents within the tunnels such as vehicle accidents, breakdowns, fires or other emergencies have the potential for a high level of emissions generation and accumulation.

Also potential health impacts have not been estimated for scenarios where:

- NorthConnex cannot be used, which will cause all NorthConnex traffic to use Pennant Hills Road, on top of the normal Pennant Hills Road traffic load,
- or where the tunnel ventilation system is not operational, which will result in much higher in-tunnel air pollution and consequently much higher levels outside the tunnel, including around the tunnel portals.

The EIS does not consider the impacts due to potential scenarios such as power outages, which will result in the shutdown of the NorthConnex ventilation system and possibly the tunnel itself.

*The health assessments must be revised to assess all potential, likely and foreseeable scenarios that will result in worst case air impacts, to provide and ensure a conservative assessment of potential NorthConnex related air impacts. Scenarios such as fires in one or both tunnels, accidents and/or breakdowns in both tunnels, power outages and other scenarios that may shut down NorthConnex must be assessed.*

**5. Impacts at residences located around the support facilities and portals during emergency and other situations have not been assessed.**

Worst case scenarios for air emissions such as when the emergency smoke extraction outlets are operating during emergency situations have not been assessed.

*Health impacts must be assessed at residences near the support facilities and portals where emissions are occurring from one or both of the emergency extraction outlets and/or one or both of the portals.*

**6. Impacts at residences have not been properly assessed during Tunnel construction.**

Worst case scenarios for air emissions during tunnel construction have not been assessed. The Project has identified that during construction, local streets will fill with up to 50 heavy vehicle movements an hour during morning peak, and up to 1810 construction vehicle movements a day, on already congested streets.

*Health impacts associated with air and diesel pollution from truck movements and added congestion, must be assessed at residences during Tunnel construction.*

**7. The ventilation system must ensure pollutant concentrations at ground level are minimised as much as possible.**

The ventilation system design must be optimised so that ground level concentrations of pollutants and therefore potential health impacts are minimised. In particular the regular and emergency extraction outlets should be as high as possible to ensure ground concentrations of pollutants are as low as possible.

*The ventilation system design must ensure the stack heights are as high as possible so that emissions at ground level are the lowest possible.*

**8. The Project must state if it is intended for the emergency smoke extraction outlets to become regular ventilation stacks if/when the tunnel becomes 3 lanes each way.**

**9. The background concentrations used for the project area have been incorrectly estimated.**

The OEH monitoring station data from Lindfield and Prospect may not be more conservative than data at the project locations between North Wahroonga and Carlingford.

The air quality assessment (Appendix C) states that conservative background ambient data were obtained from the Prospect and Lindfield OEH monitoring stations from December-March for 2009-2011 compared to project monitoring data collected between December 2013 to March 2014. However, there is no justification that the December-March period in the years between 2009-2011 can be compared to that between 2013 and 2014.

In addition emissions from December-March in these years have not been demonstrated to be representative of longer term averages.

*The EIS must demonstrate background concentrations used for the project are conservative.*

*The EIS must demonstrate the meteorological data used (between 2009 and 2011) is representative of longer term meteorology. Otherwise the emissions may not have been modelled conservatively.*

**10. It is unclear if entry portal emissions will be prevented under low traffic conditions.**

Emergency smoke extraction outlets will supply fresh air during low traffic conditions. Low speed traffic conditions are known to lessen the "piston effect" and therefore carriage of pollutants through the tunnel. In addition, the emergency smoke extraction fans may need to be operated in reverse flow to supply additional fresh air.

*The EIS must demonstrate that the air extraction rate at the portal entry will not be adversely affected under low flow conditions and where the emergency smoke extraction fans are operating in reverse*

### **11. In-tunnel exposures and vehicle emission factors have not been estimated under worst case operating conditions for air quality.**

Accurate emission factors to estimate vehicle and in-tunnel emissions must be used to ensure Project related health impacts are accurately assessed.

- a) In-tunnel concentrations of CO, nitrogen oxides (NO<sub>x</sub>), VOCs (total), PAHs (total), PM<sub>2.5</sub> and PM<sub>10</sub> have been estimated during normal operations for 2019 (scenario 2a) and 2029 (scenario 2b) (health assessment Section 5.6.1). However in-tunnel concentrations of air pollutants have not been calculated and used to assess in-tunnel air impacts based on worst case operating conditions (such as during periods of congestion, or if there is an accident or fire).
- b) The assessment of potential in-tunnel exposures also considered the concentration of pollutants in the vehicle itself, in particular where all vehicle windows are closed and air within the vehicle is being recirculated. Under these conditions exposure to external air pollutants was shown to be significantly reduced. Consequently, in-tunnel exposure to air pollutants has not been assessed based on worst case exposure scenarios.
- c) The health assessment states PIARC emission factors are expected to result in conservative emission estimates as a safety margin is added to the PIARC factors to “take a certain proportion of high emitting vehicles into account” (PIARC, 2012) however the health assessment does not explain why this proportion of high emitting vehicles does not exist in Australia. Pacific Environment Limited (PEL) undertook a peer review of the project emission inventory and concluded the emissions inventory for the project was conservative, in particular for PM<sub>10</sub> and PM<sub>2.5</sub> which were twice as high as estimated by using NSW EPA emission factors. However, the peer review of the emissions inventory is not provided with the project health assessment or air quality assessment so it is not possible to verify the statements or emission calculations used by PEL to validate the PIARC derived data used.

*The EIS must ensure that vehicle emission factors and in-tunnel air concentrations have been derived appropriately and include consideration of potential worst case emission and exposure scenarios. In addition, the PEL peer review should also be provided with the project EIS to allow verification of the emission calculations and demonstrate that they are robust and conservative.*

### **12. Acceptable risk levels.**

The calculated risks for the project, based on scenarios 2a (2019) and 2b (2029) only, were considered tolerable, which was defined for the project to be between  $1 \times 10^{-6}$  and  $1 \times 10^{-4}$  (health assessment, Section 5.4.2).

However the discussion of acceptable risk levels does not:

- discuss that most of the estimated risk levels are above the relevant NSW Planning Guidelines (2011) - the “Hazardous Industry Planning Advisory Papers” (HIPAPs), HIPAP 4, which states the suggested risk criteria developed for land use safety planning in NSW which for schools and child care facilities is  $0.5 \times 10^{-6}$  and for residences is  $1 \times 10^{-6}$ ; or
- discuss the implications associated with the use of the NSW risk criteria and the NorthConnex project.

In addition, the older (2006) NSW document Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales stated acceptance criteria for carcinogenic risk:

- less than  $1 \times 10^{-6}$  is acceptable;
- greater than  $1 \times 10^{-4}$  is not acceptable; and
- between  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  requires the implementation of best practice process design and/or emission controls in order to minimise particulate emissions to the maximum extent achievable.

*The Project must meet the NSW Planning HIPAP risk criteria of less than  $0.5 \times 10^{-6}$ .*

*Project air emissions must be minimised to the maximum extent achievable through the application of best-practice process design and/or emission controls.*

### **13. Australian derived exposure-response relationships derived should be used.**

The adopted exposure-response relationships were obtained from US based studies.

The health assessment (Section 5.2) provides background information on the choice of exposure-response relationships and states the adopted health impact functions were agreed with NSW Health as the most current and appropriate for the quantification of potential health effects for the health endpoints considered in this assessment.

The health assessment (Section 5.7.2) notes the inherent variability in the studies used to estimate exposure-response functions, and states that the variability is expected to reflect the local and regional variability in the characteristics of particulate matter to which the population is exposed.

Consequently where available, locally based studies must be preferred over those undertaken elsewhere.

*The health assessment must adopt Australian based exposure-response relationships – or demonstrate the relationships used are more conservative than Australian derived relationships.*

**14. Exposure calculations for PAHs cannot be verified.**

The range of predicted in-tunnel PAH concentrations (Section 5.6.1) cannot be verified as the health assessment does not appear to include the methodology used for PAH speciation.

*PAH speciation is missing. Consequently in-tunnel PAH concentration estimates cannot be verified.*

In summary, we strongly object to the NorthConnex proposal in its current form and recommend that NSW Department of Planning require the Project to meet best practice for design and emission controls, including full filtration for particles, nitrogen oxide and other key emissions.

Yours sincerely,

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